WHAT IS THE MONTANA DIABETES PROJECT AND HOW CAN WE BE CONTACTED:

The Montana Diabetes Project is funded through a cooperative agreement with the Centers for Disease Control and Prevention, Division of Diabetes Translation (U32CCU815663-0). The mission of the Diabetes Project is to reduce the burden of diabetes and its complications among Montanans. Our web page can be accessed at http://ahec.msu.montana.edu/diabetes/default.htm.

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MONTANA DIABETES SURVEILLANCE & CLINICAL COMMUNICATION

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MONTANA DEATHS ASSOCIATED WITH INFLUENZA AND PNEUMONIA, 1994-1996

WHAT'S INSIDE

BACKGROUND:

People with diabetes as well as persons with other chronic conditions are at high risk of morbidity and mortality associated with influenza and pneumococcal pneumonia.[1-3] The purpose of this report is to describe the impact of influenza and pneumonia associated mortality on Montanans with chronic conditions including diabetes.

METHODS:

Montana death record data from 1994-1996 were utilized to describe the influenza and pneumonia mortality associated with specific chronic diseases. Both the underlying cause of death field and any mention of disease fields were utilized to identify deaths with influenza and pneumonia as well as accompanying chronic conditions. Influenza and pneumonia deaths were defined as deaths with the following ICD-9 codes: invasive pneumococcal disease (038.2, 320.1, 481, 487 and 041.2, 790.7 and 041.2); unspecified pneumonia (482.9, 485, 486); and other pneumonia (480, 482, 483, 484). Twelve chronic conditions were identified using the following ICD-9 codes: leukemia (204-208); chronic obstructive pulmonary disease (490-496); cerebrovascular disease (430-438); diabetes (250); nephritis, nephrotic syndrome (580-589); other heart diseases (415-429); neoplasm, respiratory (160-165); chronic liver disease (571); ischemic heart disease (410-414); hypertension and hypertensive heart disease (401-404); atherosclerosis (440); other diseases of the arteries (441-448). Additionally, death record data were linked to Medicare administrative data to improve ascertainment of persons with diagnosed diabetes. Persons with any of the 12 chronic conditions listed above and/or aged 65 years and older were at risk for influenza and pneumonia.

DEATHS AMONG MONTANANS, 1994-1996:

A total of twenty-two thousand seven hundred and seven Montanans died during 1994 through 1996. The majority of deaths were among persons aged 65 and older (76%). Of the 12 chronic conditions described above, other heart diseases (30%), ischemic heart disease (19%), chronic obstructive pulmonary disease (13%), cerebrovascular disease (12%), and diabetes (11%) were most frequently listed on the death certificate.

RISK FOR INFLUENZA AND PNEUMONIA AND ASSOCIATED DEATHS:

Of the 22,707 Montana deaths from 1994 through 1996, 86% (n=19,577) had one or more conditions listed on the death certificate placing them at risk for influenza and pneumonia. Fifty-seven percent of Montana deaths had two or more conditions at high risk for influenza and pneumonia. From 1994 through 1996, 1,935 (8.5%) persons had influenza/pneumonia listed as an associated cause of death. Figure 1 displays the proportion of Montana deaths associated with influenza and pneumonia by risk group (see page 3). Figure 2 displays the proportion of Montana deaths associated with influenza and pneumonia by risk group for persons <65 years of age. Influenza and pneumonia were listed on 10% of death certificates of Montanans ≥ 65 years of age. Figure 3 displays the influenza and pneumonia associated deaths by specific chronic condition, among persons aged ≥65 years, and among persons aged <65 years with no chronic conditions.

LIMITATIONS:

Readers should consider several potential limitations of the data presented here. First, recording of underlying and contributing causes of death on death certificates is not always accurate. It is possible that ome pneumonia or influenza deaths were attributed to other causes, or that some deaths attributed to pneumonia and influenza were the results of other causes. Secondly, chronic diseases such as diabetes may be more likely to be included as a contributing cause of death on a death record when pneumonia and influenza are also listed as a cause (e.g., if the underlying cause of death was a motor vehicle crash rather than pneumonia or influenza). Such a circumstance would bias the results towards an association between chronic diseases and pneumonia or influenza deaths. Thirdly, the pneumococcal or influenza immunization status of the deceased persons was not known to the investigators. To the extent persons with chronic disease were more likely to have received these vaccines, the strength of the association between pneumonia or influenza death and chronic disease may have been diminished in this assessment. Fourth, there were no major influenza outbreaks during the years of this investigation in Montana. The results presented here could be accentuated during epidemic periods.

CONCLUSIONS:

Montanans who died and had high risk chronic conditions and/or an age of ≥65 years were over 2.5 times more likely to have influenza and pneumonia listed as a cause of death as compared to those without a high risk condition. One in ten deaths among persons aged ≥65 from 1994 through 1996 had influenza or pneumonia listed as a cause of death. These data suggest that influenza and pneumonia contribute to a large number of deaths in Montana, particularly among persons with leukemia, COPD, cerebrovascular disease and diabetes. These deaths are potentially preventable through increasing influenza and pneumococcal immunizations among Montanans.

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2. CDC. Prevention and control of influenza: recommendations from the Advisory Committee on Immunization Practices (ACIP). MMWR 1997;46(No. RR-9).
3. CDC. Prevention of pneumococcal disease: recommendations from the Advisory Committee on Immunization Practices (ACIP). MMWR 1997;46(No. RR-8):1-24.

FIGURE 1. Percentage of deaths associated with influenza and pneumonia among persons at high risk (chronic condition or age 65 years and older) versus those at low risk, Montana, 1994-1996.

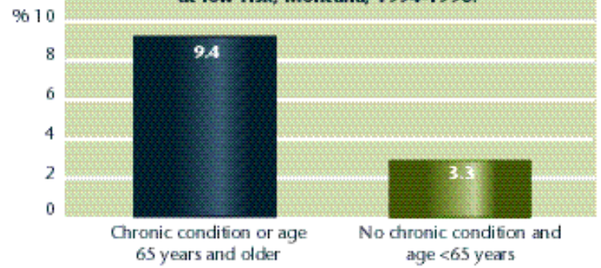


FIGURE 2. Percentage of deaths associated with influenza and pneumonia among persons age 18-64 at high risk (chronic condition) versus those at low risk, by age category, Montana, 1994-1996.

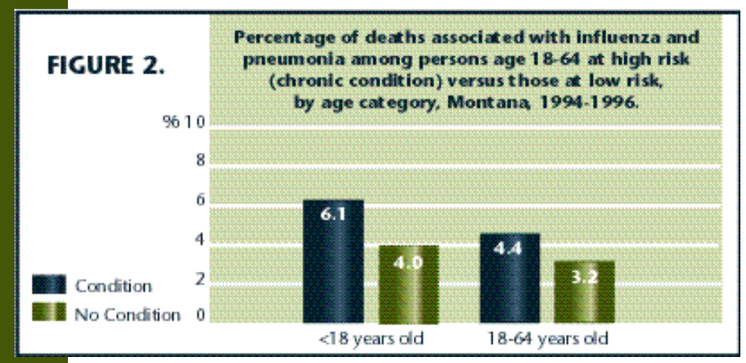
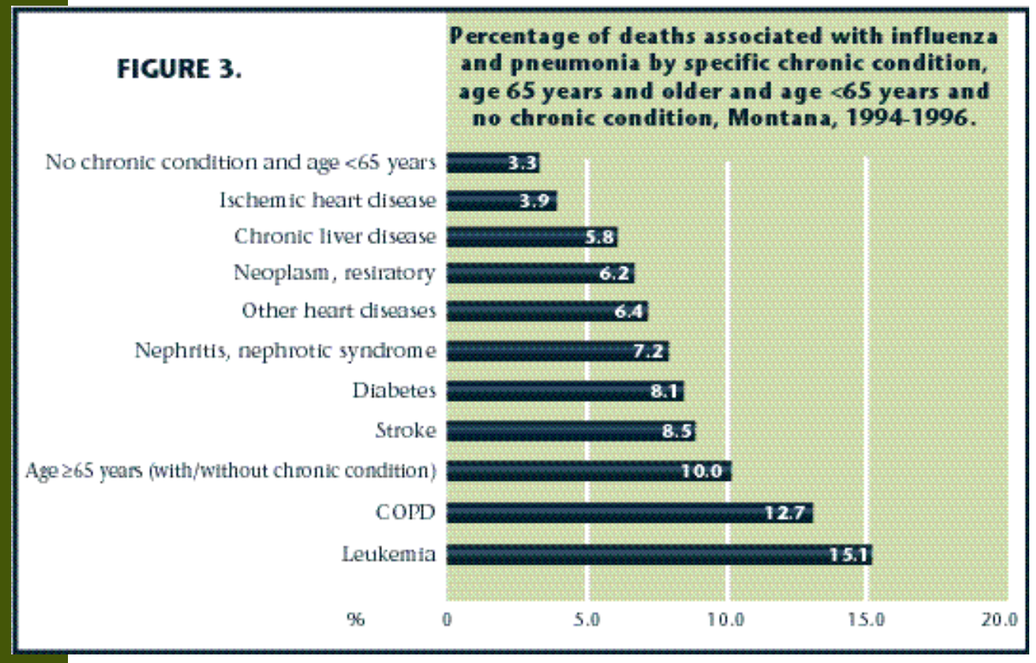


FIGURE 3. Percentage of deaths associated with influenza and pneumonia by specific chronic condition, age 65 years and older and age <65 years and no chronic condition, Montana, 1994-1996.



INFLUENZA AND PNEUMOCOCCAL IMMUNIZATION RATES AMONG MONTANANS, 1993, 1995, 1997.

BACKGROUND:

At least a one-time pneumococcal immunization and an annual influenza immunization are recommended for people with chronic diseases including diabetes.[1-2] Although these recommendations have been published for several years, opportunities to increase both pneumococcal and influenza immunizations exist.[3] The purpose of this report is to describe the influenza and pneumococcal pneumonia immunization rates among adult Montanans at high risk for the flu and pneumonia as well as the immunization rates for all adult Montanans.

METHODS:

Each year the Montana Department of Public Health and Human Services (MT DPHHS) conducts the Behavioral Risk Factor Surveillance System (BRFSS) telephone survey of a representative sample (N=1,800) of Montana adults (≥18 years of age). Information regarding influenza and pneumococcal immunizations, diabetes, hypertension and high cholesterol have been collected simultaneously in 1993, 1995 and in 1997. Survey respondents aged 65 years or older and those reporting a diagnosis of diabetes, hypertension, or high cholesterol were defined as being at high risk for influenza and pneumococcal pneumonia.

TABLE 1. Characteristics of BRFSS respondents, Montana, 1993, 1995, 1997.

Characteristics	# (%)
Age (years)	
18-44	2108 (50%)
45-64	1192 (29%)
≥65	880 (21%)
Gender	
Male	1753 (42%)
Female	2432 (58%)
Have high blood pressure	
Yes	955 (23%)
No	3219 (77%)
Have high cholesterol	
Yes	853 (20%)
No	3332 (80%)
Have diabetes	
Yes	159 (4%)
No	4026 (96%)
High risk for flu and pneumonia*	
Yes	1882 (45%)
No	2297 (55%)

*High risk includes hypertension, high cholesterol, diabetes, and age ≥65

CHARACTERISTICS OF BRFSS RESPONDENTS, 1993, 1995, 1997:

Table 1 displays the characteristics of BRFSS respondents. The majority of respondents were 18-44 years of age (50%) and female (58%). Over twenty percent of respondents reported having hypertension and high cholesterol and 4% reported having a diagnosis of diabetes. Forty-five percent of respondents had one or more risk factors for influenza and pneumonia.

INFLUENZA AND PNEUMOCOCCAL IMMUNIZATION RATES:

The overall influenza (past year) and pneumococcal (ever) immunization rates for BRFSS respondents were 31% (1,289/4,185), and 16% (647/4,185), respectively. Table 2 displays the immunization rates by age, gender and high-risk status. Influenza and pneumococcal immunization rates increased with age. BRFSS respondents at high risk for influenza and pneumonia as compared to those at low risk were more like to report having an influenza (47% vs. 18%) and pneumococcal immunization (26% vs. 6%).

INFLUENZA AND PNEUMOCOCCAL IMMUNIZATION RATES BY HIGH-RISK STATUS:

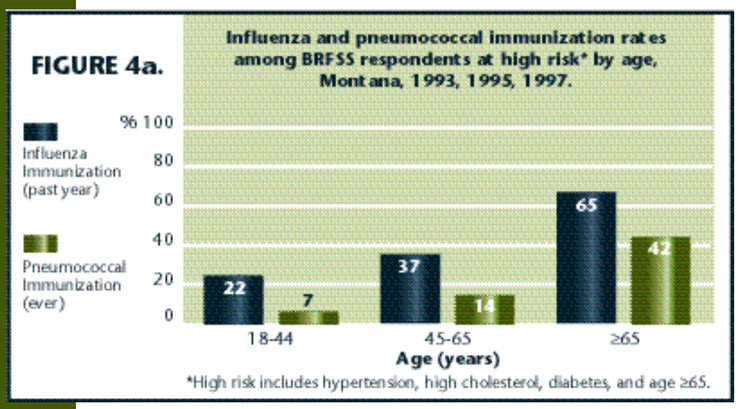
Figure 4a and 4b display the influenza and pneumococcal immunization rates among BRFSS respondents at high risk by age and gender. Older respondents were more likely to report having had an influenza and pneumococcal immunization as compared to younger respondents. Females tended to have higher immunization rates as compared to males. Figure 5 displays the influenza and pneumococcal immunization rates per year for BRFSS respondents at high risk. Similarly, figure 6a and 6b displays the immunization rates by year and age for respondents at high risk for influenza and pneumonia.

TABLE 2. Influenza and pneumococcal immunization rates among BRFSS respondents, Montana, 1993, 1995, 1997.

	Influenza immunization (past year)	Pneumococcal immunization (ever)
	No. immunized/Total population (%)	No. immunized/Total population (%)
Age (years)		
18-44	333/2108 (16%)	129/2108 (6%)
45-64	382/1192 (32%)	148/1192 (12%)
≥65	571/880 (65%)	368/880 (42%)
Gender		
Male	490/1753 (28%)	251/1753 (14%)
Female	799/2432 (33%)	396/2432 (16%)
High risk*		
Yes	875/1882 (47%)	497/1882 (26%)
No	411/2297 (18%)	148/2297 (6%)
Total	1289/4185 (31%)	647/4185 (16%)

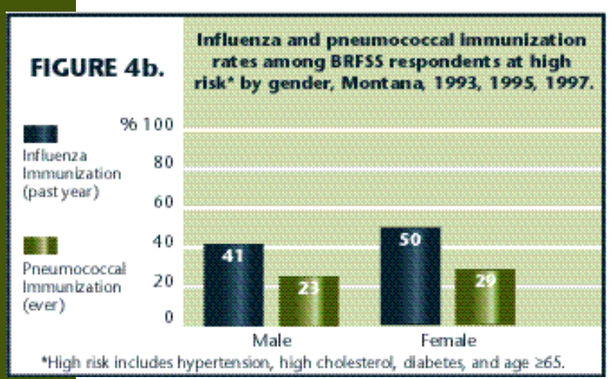
*High risk includes hypertension, high cholesterol, diabetes, and age ≥65

FIGURE 4a. Influenza and pneumococcal immunization rates among BRFSS respondents at high risk* by age, Montana, 1993, 1995, 1997.



*High risk includes hypertension, high cholesterol, diabetes, and age ≥65.

FIGURE 4b. Influenza and pneumococcal immunization rates among BRFSS respondents at high risk* by gender, Montana, 1993, 1995, 1997.



*High risk includes hypertension, high cholesterol, diabetes, and age ≥65.

LIMITATIONS:

There are a number of limitations to the data presented above. First, these data were collected via telephone survey and are self-reported, raising concerns about reliability and validity. Previous studies, however, have found that self-reported diabetes diagnosis as well as influenza vaccination status to be reliable. Second, because the surveys were conducted by telephone the immunization status of Montanans living in households without telephones are not reflected in this report.

CONCLUSIONS:

The findings suggest that a large proportion of Montana adults are at risk for influenza

and pneumonia (45%). The 1995 and 1997 data among persons aged 65 years and older suggests that Montana has reached the DPHHS National Health Objective of >60% influenza immunization rates. However, only 47% of all respondents at high risk reported receiving an influenza immunization in the past year and only 26% had ever received a pneumococcal immunization. Opportunities to improve influenza and pneumococcal immunization rates continue to exist, particularly among at-risk Montanans less than 65 years of age.

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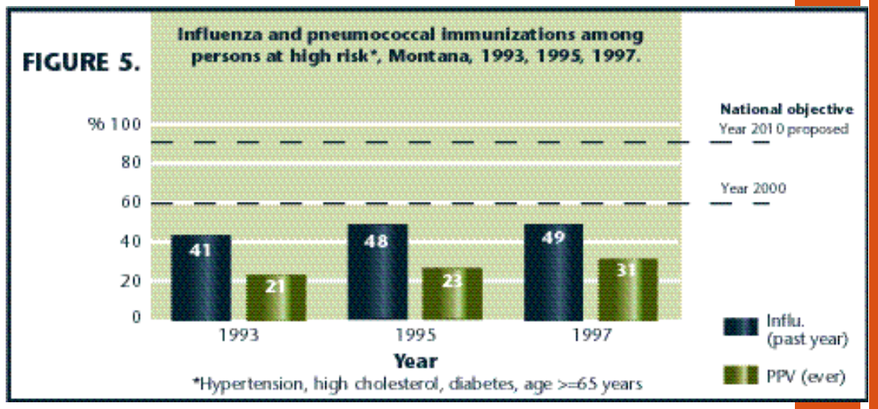

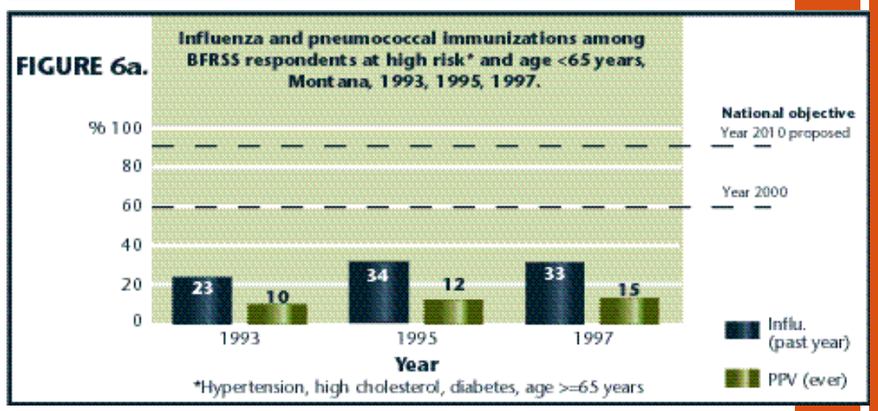

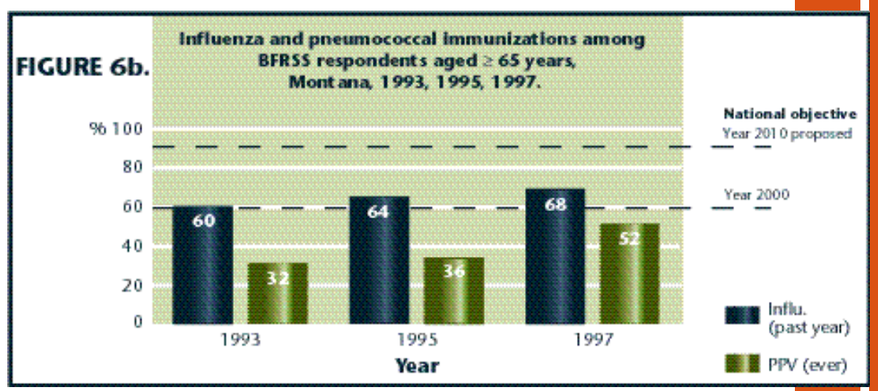

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2. CDC. Prevention of pneumococcal disease: recommendations from the Advisory Committee on Immunization Practices (ACIP). MMWR 1997;46(No. RR-8):1-24.
3. CDC. Influenza and pneumococcal vaccination levels among adults aged ≥65 years-United States, 1997. MMWR 1998;47(38):797-802.

GUIDELINES FOR INFLUENZA AND PNEUMOCOCCAL IMMUNIZATIONS:

Listed below is a summary of the Centers for Disease Control and Prevention's (CDC) recommendations for influenza and pneumococcal immunizations and answers to common adult immunization questions.

Who should receive a yearly influenza immunization?

- ✓ all persons 65 years of age and older
- ✓ residents of nursing homes and chronic care facilities
- ✓ persons with chronic cardiopulmonary disorders or metabolic diseases (including diabetes mellitus, hemoglobinopathies, immunosuppression, or renal dysfunction, and children with asthma)
- ✓ women who will be in the second or third trimester of pregnancy during the influenza season
- ✓ health care workers and other personnel in both hospital and out-patient care settings
- ✓ employees of nursing homes and chronic care facilities who have contact with patients or residents
- ✓ providers of home care to persons at high risk
- ✓ household members in close contact with persons in high risk groups
- ✓ any person who wishes to reduce the chance of becoming infected with influenza

Who should not be vaccinated? Persons with egg allergies or a history of severe reaction to a previous influenza vaccination.

When should influenza vaccine be given? October through November.

Can the influenza vaccine be given at the same time as other vaccines? Yes. Other vaccines (e.g., pneumococcal vaccine) can be administered at the same time at a different site without increasing side effects.

Who should receive a pneumococcal immunization?

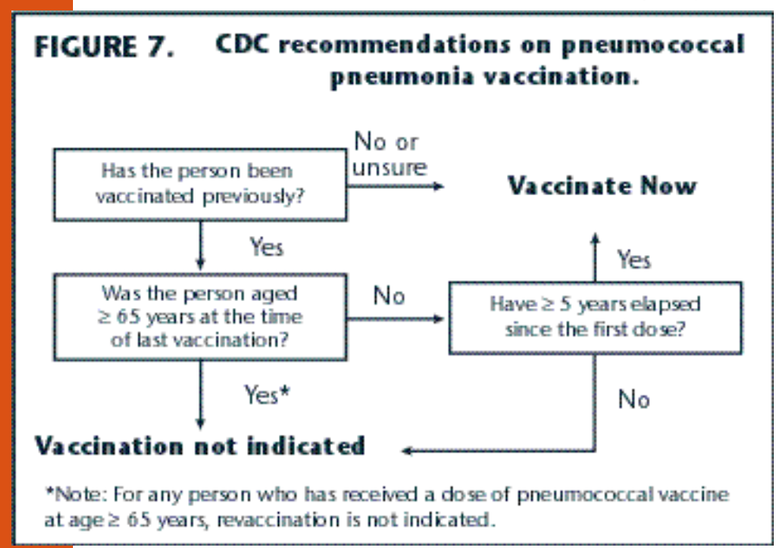
- ✓ all persons 65 years of age and older
- ✓ persons aged 2-64 with chronic cardiovascular disease, chronic pulmonary disease, diabetes mellitus, alcoholism, chronic liver disease, cerebrospinal fluid leaks, or functional or anatomic asplenia
- ✓ immunocompromised persons aged ≥ 2 years (e.g., HIV infection, leukemia, lymphoma, hodgkins disease, chronic renal failure, nephrotic syndrome)

Who should not receive a pneumococcal vaccination? The safety of pneumococcal vaccine during the first trimester of pregnancy has not been evaluated.

When should pneumococcal vaccine be given? At any time during the year.

Can the pneumococcal vaccine be given at the same time as other vaccines? Yes.

How often should someone receive the pneumococcal vaccine? Persons in the high risk groups described above should be vaccinated once. Revaccination once (after 5 years) is recommended for persons ≥2 years of age who are at highest risk for serious pneumococcal infection and those likely to have a rapid decline in pneumococcal antibody levels. Persons aged ≥65 should be administered a second dose based on the algorithm below (Figure 7). Revaccination is not recommended for persons who have received a dose of pneumococcal vaccine at age 65 or over.



For copies of the CDC guidelines on influenza and pneumococcal immunizations or questions about adult or childhood immunizations please call the MT DPHHS Immunization Program at 406/444-5580.